



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/747,617

12/30/2003

Martinus Godefridus Helena Boogaarts

081468-0307394

2869

909

7590

04/05/2006

PILLSBURY WINTHROP SHAW PITTMAN, LLP
P.O. BOX 10500
MCLEAN, VA 22102

EXAMINER

TURNER, SAMUEL A

ART UNIT

PAPER NUMBER

2877

DATE MAILED: 04/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/747,617	Applicant(s) BOOGAARTS ET AL.	
	Examiner Samuel A. Turner	Art Unit 2877	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 December 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 and 28-33 is/are pending in the application.
- 4a) Of the above claim(s) 26,27,34 and 35 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 28 and 33 is/are allowed.
- 6) ☒ Claim(s) 1-4,8-10,15-18,20 and 29-32 is/are rejected.
- 7) ☒ Claim(s) 5-7,11-14,19 and 21-25 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 December 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

Applicant's election with traverse of Group I, claims 1-25, and 28-33 in the reply filed on 27 December 2005 is acknowledged. The traversal is on the ground(s) that the subject matter is so similar that it would require the same search and is classified in the same area. This is not found persuasive because applicant has not pointed out the supposed errors in the restriction requirement, nor has applicant argued that the inventions are not patentably distinct. Applicant only that they are of common subject matter and they would require a common search.

The Examiner disagrees. Only group I contains limitations to the position disturbance correction system which would differentiate the search of group I from the non-elected Groups. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

The requirement is still deemed proper and is therefore made FINAL.

Claims

This application contains claims 1-28, 30, 31, and 34-38. In numbering the claims 28, 29, 32, and 33 have been skipped. Under 37 CFR 1.175(f) claims must be numbered consecutively in Arabic numerals. Therefor, in this action claims 1-28, 30, 31, and 34-38 will be referred to as claims 1-35, as if they were renumbered in order. Applicant must amend the claims to correspond to this renumbering.

Title

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Abstract

The abstract of the disclosure is objected to because the abstract must be limited to a single paragraph. Correction is required. See MPEP § 608.01(b).

Drawings

The drawings are objected to because the drawings are informal having handwritten legends and numerals (all figures) as well as poor shading (figure 7).

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application.

Replacement Drawing Sheets

Drawing changes must be made by presenting replacement sheets which incorporate the desired changes and which comply with 37 CFR 1.84. An explanation of the changes made must be presented either in the drawing amendments section, or remarks, section of the amendment paper. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). A replacement sheet must include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of the amended drawing(s) must not be labeled as "amended." If the changes to the drawing figure(s) are not accepted by the examiner, applicant will be notified of any required corrective action in the next Office action. No further drawing submission will be required, unless applicant is notified.

Identifying indicia, if provided, should include the title of the invention, inventor's name, and application number, or docket number (if any) if an application number has not been assigned to the application. If this information is provided, it must be placed on the front of each sheet and within the top margin.

Art Unit: 2877

Annotated Drawing Sheets

A marked-up copy of any amended drawing figure, including annotations indicating the changes made, may be submitted or required by the examiner. The annotated drawing sheet(s) must be clearly labeled as "Annotated Sheet" and must be presented in the amendment or remarks section that explains the change(s) to the drawings.

Timing of Corrections

Applicant is required to submit acceptable corrected drawings within the time period set in the Office action. See 37 CFR 1.85(a). Failure to take corrective action within the set period will result in ABANDONMENT of the application.

If corrected drawings are required in a Notice of Allowability (PTOL-37), the new drawings MUST be filed within the THREE MONTH shortened statutory period set for reply in the "Notice of Allowability." Extensions of time may NOT be obtained under the provisions of 37 CFR 1.136 for filing the corrected drawings after the mailing of a Notice of Allowability.

Claim Objections

In claim 25, the phrase "a most" should be --at most--.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 29-31 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As for claims 29-31, originally numbered claims 30, 31, and 34, these claims are dependent on claim 29 which did not exist. It is unclear as to which claim these

Art Unit: 2877

claims depend. For purposes of the below rejections, it will be assumed that claims 29-31 depend from claim 28.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-4, 8-10, 18, 20, and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Loopstra et al(WO 98/40791) in view of Sato et al(5,511,930).

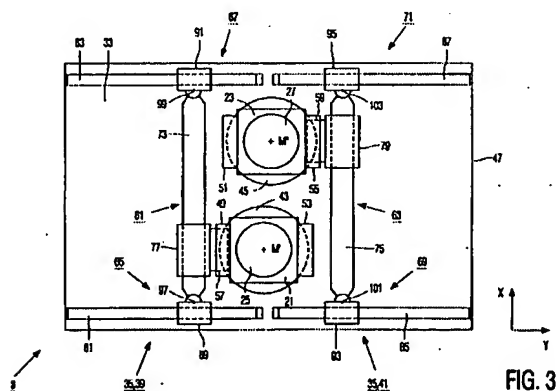


FIG. 3

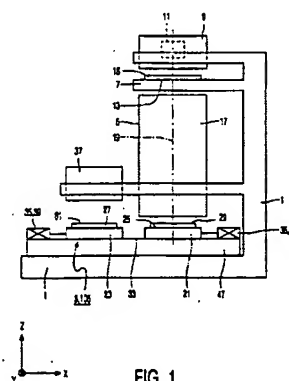
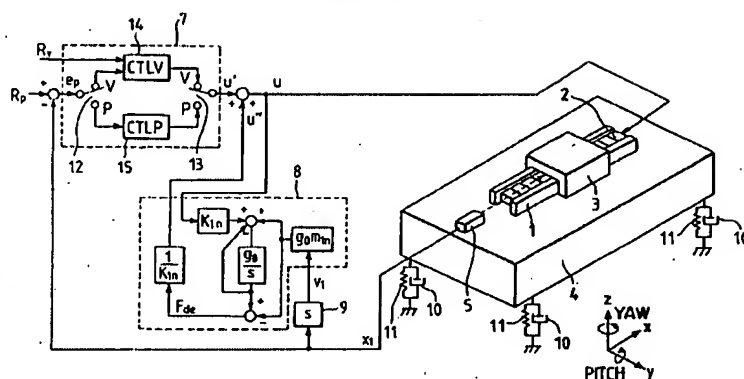


FIG. 1

FIG. 1



With regard to claim 1, Loopstra et al teach a lithographic projection apparatus, comprising:

a housing(inherent in any exposure device to maintain an ultra-clean environment);

a first exposure system having at least one movable part(figure 3), said at least one movable part being located within said housing, said first exposure system including:

(i) a radiation system configured to provide a beam of radiation(9; page 6, lines 8-30);

(ii) a support structure configured to support a patterning device that serves to impart the beam of radiation with a pattern in its cross-section(7; page 6, lines 8-30);

(iii) a first substrate holder for holding a substrate(21; page 6, lines 8-30);

(iv) a projection system configured to project the patterned beam onto a target portion of said substrate(17; page 6, lines 8-30);

(v) a positioning device configured to position said first substrate holder relative to said projection system(3; page 6, lines 8-30); and

(vi) a first control unit configured to control said positioning device(35; page 6, lines 8-30).

Loopstra et al fail to teach (vii) a position disturbance correction system constructed to counteract a disturbance of a position of said first substrate holder, wherein the disturbance is caused by gas movements induced by movement of said at least one movable part.

Sato et al teach a precision positioning apparatus for an exposure apparatus including a means for correcting the disturbance of posture or vibration based on the guide mechanism. See figure 1 and column 8, lines 40-63.

It would have been obvious to one of ordinary skill in the art at the time the invention was made modify the Loopstra apparatus by including the disturbance correction means, taught by Sato et al, into the displacement control unit 35 in order to compensate for posture or vibration of positioning device 3 guide mechanism.

The remaining claim limitation found in claim 1, "the disturbance is caused by gas movements induced by movement of said at least one movable part" is a functional limitation and this limitation can be met by the prior art if the structure

Art Unit: 2877

of the prior art is capable of performing the claimed function. The disturbance correction means, of Sato et al, is capable of correcting for movements of the one moveable part, in the case the positioning device.

2114 [R-1] Apparatus and Article Claims — Functional Language

**APPARATUS CLAIMS MUST BE STRUCTURALLY DISTINGUISHABLE FROM
THE PRIOR ART**

While features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. In re Schreiber, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997) (The absence of a disclosure in a prior art reference relating to function did not defeat the Board's finding of anticipation of claimed apparatus because the limitations at issue were found to be inherent in the prior art reference); see also In re Swinehart, 439 F.2d 210, 212-13, 169 USPQ 226, 228-29 (CCPA 1971); In re Danly, 263 F.2d 844, 847, 120 USPQ 528, 531 (CCPA 1959). "[A]pparatus claims cover what a device is, not what a device does." Hewlett-Packard Co. v. Bausch & Lomb Inc., 909 F.2d 1464, 1469, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990) (emphasis in original).

As to claim 2, wherein said at least one movable part comprises at least one of said support structure and said first substrate holder(21; page 6, lines 8-30).

As to claim 3, wherein said housing comprises an additional movable part, which is movable by a second control unit(23, 15; page 6, lines 8-30).

As to claim 4, wherein said additional movable part comprises at least one of a second exposure stage that has at least a movable second substrate holder and a measuring stage for measuring a property of a substrate that has at least one of a movable substrate measuring table and a movable measuring unit(23, figure 3; page 6, lines 8-30).

As to claim 8, wherein at least one of said first and second control unit are designed to maintain a predetermined minimum distance between said first substrate holder and said additional moving part at least during projecting of the patterned beam, this is met when the additional moving part is the mask support structure since this distance only varies by the Z displacement of the substrate support positioning device(7,15; page 6, lines 8-30).

As to claim 9, wherein the predetermined minimum distance is equal to at least 50% of a time averaged distance between said first substrate holder and said additional movable part at least during projecting of the patterned beam, this is met when the additional moving part is the mask support structure since this distance only varies by the Z displacement of the substrate support positioning device(7,15; page 6, lines 8-30).

As to claim 10, wherein the predetermined minimum distance is substantially equal to said time averaged distance, this is met when the additional moving part is the mask support structure since this distance only varies by the Z displacement of the substrate support positioning device(7,15; page 6, lines 8-30).

As to claim 18, wherein said position disturbance correction system comprises a planar motor for moving said at least one movable part(35,39,41; page 6, lines 8-30).

As to claim 20, wherein said position disturbance correction system comprises at least one of a first substrate holder drive unit(35,39,41; page 6, lines 8-30) and a

Art Unit: 2877

projection system movement device constructed for moving at least a part of said projection system with respect to said housing, such that a displacement of a target portion with respect to the projection beam due to gas movement is counteracted.

The remaining claim limitation found in claim 20, "constructed for moving at least a part of said projection system with respect to said housing, such that a displacement of a target portion with respect to the projection beam due to gas movement is counteracted" is a functional limitation and this limitation can be met by the prior art if the structure of the prior art is capable of performing the claimed function. The disturbance correction means, of Sato et al, is capable of correcting for movements of the one moveable part, in the case the positioning device.

2114 [R-1] Apparatus and Article Claims — Functional Language

APPARATUS CLAIMS MUST BE STRUCTURALLY DISTINGUISHABLE FROM THE PRIOR ART

While features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. In re Schreiber, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997) (The absence of a disclosure in a prior art reference relating to function did not defeat the Board's finding of anticipation of claimed apparatus because the limitations at issue were found to be inherent in the prior art reference); see also In re Swinehart, 439 F.2d 210, 212-13, 169 USPQ 226, 228-29 (CCPA 1971); In re Danly, 263 F.2d 844, 847, 120 USPQ 528, 531 (CCPA 1959). "[A]pparatus claims cover what a device is, not what a device does." Hewlett-Packard Co. v. Bausch & Lomb Inc., 909 F.2d 1464, 1469, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990) (emphasis in original).

Art Unit: 2877

With regard to claim 32, Loopstra teaches a lithographic projection apparatus, comprising:

a radiation system configured to provide a beam of radiation(9; page 6, lines 8-30);

a support structure configured to support a patterning device that serves to impart the beam of radiation with a pattern in its cross-section(7; page 6, lines 8-30);

a substrate holder for holding a substrate(21; page 6, lines 8-30);

a projection system configured to project the patterned beam onto a target portion of said substrate(17; page 6, lines 8-30); and

a positioning device configured to position said substrate holder relative to said projection system(3; page 6, lines 8-30).

Loopstra et al fail to teach a position disturbance correction system that counteracts a disturbance of a position of said substrate holder, wherein the disturbance is caused by gas movements induced by movement of said at least one of said support structure and said substrate holder.

Sato et al teach a precision positioning apparatus for an exposure apparatus including a means for correcting the disturbance of posture or vibration based on the guide mechanism. See figure 1 and column 8, lines 40-63.

It would have been obvious to one of ordinary skill in the art at the time the invention was made modify the Loopstra apparatus by including the disturbance

correction means, taught by Sato et al, into the displacement control unit 35 in order to compensate for posture or vibration of positioning device 3 guide mechanism.

The remaining claim limitation found in claim 32, "the disturbance is caused by gas movements induced by movement of said at least one of said support structure and said substrate holder" is a functional limitation and this limitation can be met by the prior art if the structure of the prior art is capable of performing the claimed function. The disturbance correction means, of Sato et al, is capable of correcting for movements of the one moveable part, in the case the positioning device.

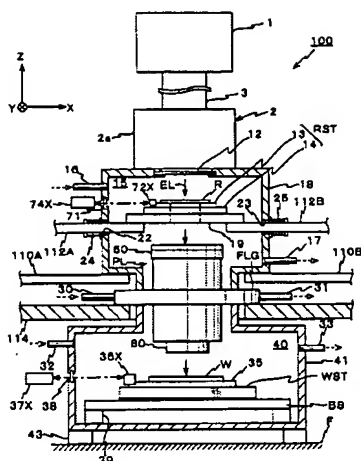
2114 [R-1] Apparatus and Article Claims — Functional Language

APPARATUS CLAIMS MUST BE STRUCTURALLY DISTINGUISHABLE FROM THE PRIOR ART

While features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. In re Schreiber, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997) (The absence of a disclosure in a prior art reference relating to function did not defeat the Board's finding of anticipation of claimed apparatus because the limitations at issue were found to be inherent in the prior art reference); see also In re Swinehart, 439 F.2d 210, 212-13, 169 USPQ 226, 228-29 (CCPA 1971); In re Danly, 263 F.2d 844, 847, 120 USPQ 528, 531 (CCPA 1959). "[A]pparatus claims cover what a device is, not what a device does." Hewlett-Packard Co. v. Bausch & Lomb Inc., 909 F.2d 1464, 1469, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990) (emphasis in original).

Claims 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Loopstra et al(WO 98/40791) in view of Sato et al(5,511,930) as applied to claims 1-4, 8-10, 18, 20, and 32 above, and further in view of Shiraishi(2003,0202165).

Fig. 1



As to claim 15, Loopstra et al fail to teach, wherein a wall, which at least partly surrounds a first space in which said movable part is located, comprises at least one aperture, and wherein said first space communicates with a second space behind said wall, as seen from the movable part.

Shiraishi teaches an exposure apparatus in which a partition wall 41 and flange FLG isolate the wafer chamber 40. The wafer chamber includes both optical apertures 38 and 80, as well as gas apertures 32 and 33(paragraph [0095]).

It would have been obvious to one of ordinary skill in the art at the time the invention was made include both optical and gas apertures in any housing of Loopstra in order to expose the wafer(optical) and provide the nitrogen supply(gas).

As to claim 16, wherein said second space comprises the environment outside the lithographic projection apparatus(80; paragraph [0107]) or (32,33; paragraph [0095]).

As to claim 17, further comprising a gas transport mechanism configured to transport a flow of gas pass said substrate during projection of the patterned beam onto said substrate, and wherein said position disturbance correction system comprises gas suction mechanism configured to suction gas out of the flow after the flow has passed said substrate(32,33; paragraph [0095]).

Allowable Subject Matter

Claims 28 and 33 are allowed in view of the prior art of record.

Claims 5-7, 11-14, 19, and 21-25 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 29-31 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action.

With regard to claim 28, the prior art of record fails to teach the limitation of "correcting a disturbance of a position of said substrate during said projecting, wherein the position disturbance is caused by gas movements induced by movement of said at least one movable part" in combination with the remaining method limitations of claim 28.

With regard to claim 33, the prior art of record fails to teach the means-plus-function limitation of a "means for counteracting a disturbance of a position of said substrate holder, wherein the positional disturbance is caused by gas movements" in combination with the remaining apparatus limitations of claim 33.

As to claims 5-7, the prior art of record fails to teach the limitation of “a separation wall, which can be positioned between said additional movable part and at least one of said first substrate holder and said patterning device” in combination with the remaining limitations of claims 1 and 5.

As to claims 1 and 13, the prior art of record fails to teach the limitation “wherein said position disturbance correction system is constructed to reduce a speed of said additional movable part to a speed value, which is less than a predetermined maximum speed value, when a distance between said first substrate holder and said additional movable part is less than a predetermined minimum distance value” in combination with the remaining limitations of claims 1 and 11.

As to claims 12 and 14, the prior art of record fails to teach the limitation “wherein said position disturbance correction system is constructed to reduce an acceleration of the additional movable part to an acceleration value, which is less than a predetermined maximum acceleration value, when a distance between said first substrate holder and said additional movable part is less than a predetermined minimum distance value” in combination with the remaining limitations of claims 1 and 12.

As to claim 19, the prior art of record fails to teach the limitation “wherein said position disturbance correction system comprises at least one loudspeaker for moving gas at least in a space surrounding said movable part” in combination with the remaining limitations of claims 1 and 19.

Art Unit: 2877

As to claims 21 and 22, the prior art of record fails to teach the limitation “wherein said position disturbance correction system comprises a third control unit comprising, at least one of a gas pressure sensitive device and an interferometer system configured to measure at least one of gas displacement and a gas pressure changes, and a position correction information retrieval system configured to provide previously determined information on position correction as a function of movement of said at least one movable part of the measurement system” in combination with the remaining limitations of claims 1 and 21.

As to claims 23-25, the prior art of record fails to teach the limitation “wherein said radiation comprises electromagnetic radiation having a wavelength for which transmissive optics are available, and wherein said position disturbance correction system comprises a vacuum system constructed for decreasing a gas pressure inside said housing, at least at the position of said at least one movable part” in combination with the remaining limitations of claims 1 and 23.

As to claims 29-31, the prior art of record fails to teach the limitations of claim 28, if these claims are amended to depend from claim 28.

Relevant Prior Art

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Hill(6,842,256), see figures 1 and 4; and Wakui et al(EPA-0577100A1), see figure 4.

Art Unit: 2877

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Samuel A. Turner whose phone number is 571-272-2432.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley, Jr., can be reached on 571-272-2800 ext. 77.

The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'Samuel A. Turner', with a stylized flourish at the end.

Samuel A. Turner
Primary Examiner
Art Unit 2877